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(56) Documents Cited

GB 1197531 A GB 0945198 A GB 0874718 A  
US 4103400 A

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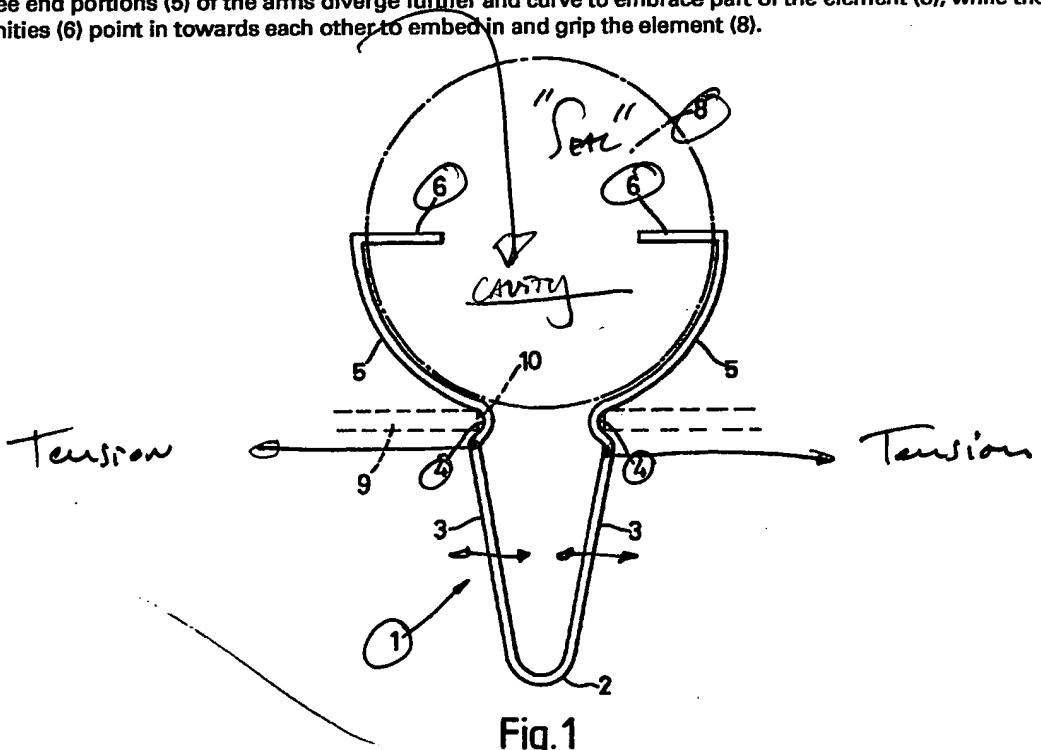
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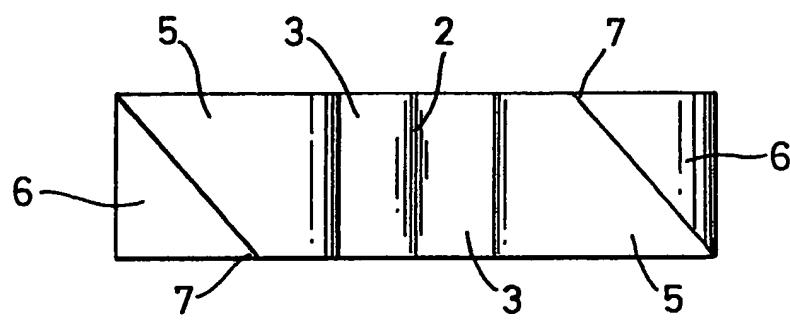
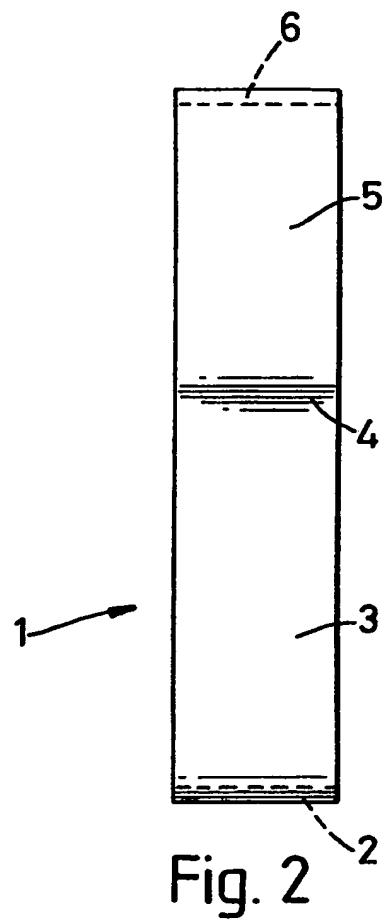
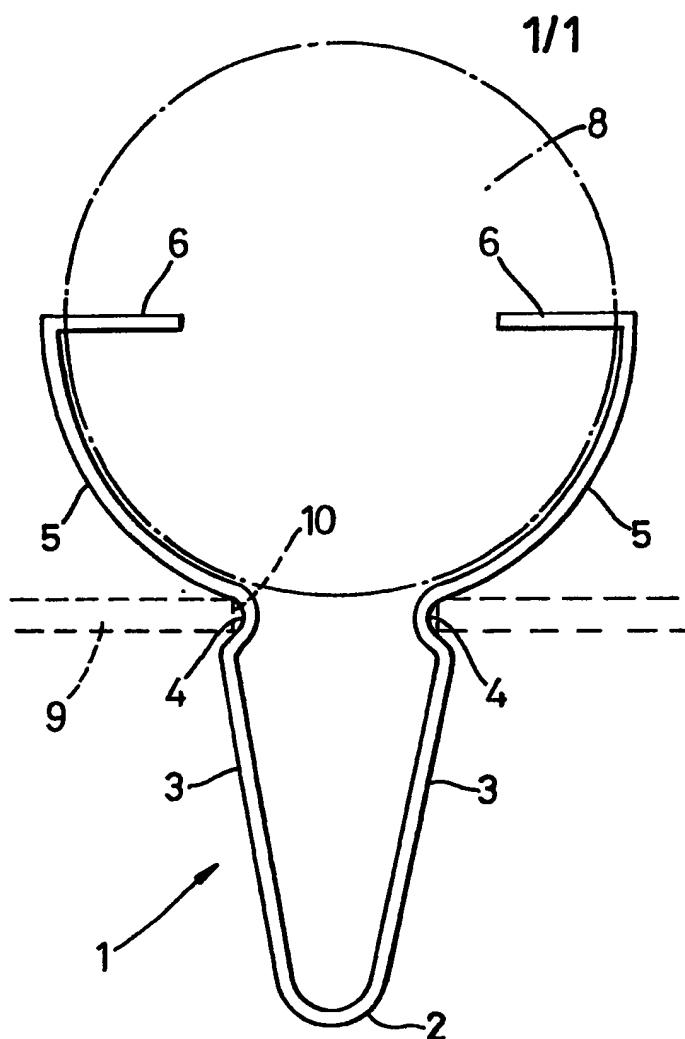
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## (54) Improvements relating to spring clips

(57) A spring clip (1) is designed to snap into an aperture and hold to the surface of the member having that aperture a rope-like element (8), such as a seal for a fire door. The clip is of modified V-form, the arms (3, 5) having indents (4) at intermediate points to locate in the aperture when the clip is pressed in vertex (2) first. The free end portions (5) of the arms diverge further and curve to embrace part of the element (8), while their extremities (6) point inwards to embed in and grip the element (8).





"Improvements relating to Spring Clips"

This invention relates to spring clips. It is primarily concerned with clips for attaching elongate rope-like elements, such as seals, to a door or its surround.

5 The usual present practice involves a number of steps. First, the rope is placed on a jig, and then a clip is offered up to the rope, ensuring that it is in the correct position lengthways of it to marry up with a hole to which it will fasten. Then pliers are used to tighten the clip  
10 onto the rope. It then has to be removed from the jig, and when the rope is lined up with the clips opposite their holes, each clip is driven home by using a hammer.

This is time-consuming and crude, and the aim of this invention is to simplify and speed up this process, eliminating the jig, pliers and hammer.

According to the present invention there is provided a spring clip for rope-like elements, such as seals for fire doors, the clip being an integral elongate member configured into modified V-form with the arms indented towards each  
20 other at intermediate points to form a neck, and then, towards their free ends, first diverging again and finally turning in towards each other as opposed jaws.

Preferably, these jaws will be barbed or pointed. They will thus dig in to the rope-like element positively to  
25 retain it.

Generally, the outer portions between the neck and the jaws diverge to a greater extent than the inner portions

adjacent the vertex. The outer portions may be curved convexly away from the centre line of the clip, and the centre of curvature may be on the intersection of said centre line and the mutual projection of said jaws.

5 Preferably, the elongate member will be of uniform cross section spring metal strip, but it could be made from wire.

These clips do not have to be gripped on to the rope-like element before the latter is fitted. Each clip can be 10 held in turn over its hole with the vertex just in the hole and with jaws spread. The rope is passed between them, and the jaws are closed towards each other lightly biting into the rope. Then the rope is locally pressed towards the hole, and as the clip passes further into it, the arms are wedged 15 together, thus increasing the grip of the jaws. Finally, there is a very slight relaxation as the neck snaps into the hole and the clip is secure. This can be repeated along the length of the rope.

For a better understanding of the invention, one 20 embodiment will now be described, by way of example, with reference to the accompanying drawing, in which:

Figure 1 is a front elevation of a spring clip,

Figure 2 is a side elevation of the clip of Figure 1,  
and

25 Figure 3 is a plan view of the clip of Figure 1.

The clip 1 is integrally formed from a flat uniform cross-section strip of spring steel. When fully shaped, it is of modified V-form, having a sharply curved vertex 2 and

inner arm portions 3 which diverge at a small angle. The strip is then symmetrically indented with recesses 4 in the outside of each arm at about their mid-length. Beyond these, the arms diverge again in outer, curved portions 5. Their 5 extremities are turned inwards towards each other and cut off at an angle to form pointed jaws 6. As best seen in Figure 3, the points 7 of these jaws are not directly opposed, but are at opposite edges of the strip. The curvature of the portions 5 is circular and centred on the 10 intersection of the plane of symmetry between the arms and the plane of the jaws. However, other shapes would be possible if the clip was to retain other than circular section elements.

This clip is designed to retain a rope-like element 8 15 to a plate 9, using a hole 10 in the latter. The diameter of this hole matches the horizontal distance between the recesses 4, measured from the outside, when the clip is in the relaxed state.

As explained above, and as can be seen from Figure 1, 20 the clip 1 will wedge into the hole 10 and locate with a snap as the recesses 4 reach the plate 9. This wedging will help embed the jaws 6 into the sides of the element 8. The clip will leave the outer segment of the element 8 free, and therefore will not impair any sealing.

CLAIMS

1. A spring clip for rope-like elements, such as seals for fire doors, the clip being an integral elongate member configured into modified V-form with the arms indented towards each other at intermediate points to form a neck, and then, towards their free ends, first diverging again and finally turning in towards each other as opposed jaws.
2. A spring clip as claimed in Claim 1, wherein the jaws are barbed or pointed.
3. A spring clip as claimed in Claim 1 or 2, wherein the outer portions between the neck and the jaws diverge to a greater extent than the inner portions adjacent the vertex.
4. A spring clip as claimed in Claim 1, 2 or 3, wherein the outer portions curve convexly away from the centre line of the clip.
5. A spring clip as claimed in Claim 4, wherein the centre of curvature is on the intersection of said centre line and the mutual projection of said jaws.
6. A spring clip as claimed in any preceding claim, wherein the elongate member is of uniform cross-section spring metal strip.
7. A spring clip as claimed in any preceding claim, wherein the elongate member is of spring wire.
8. A spring clip for rope-like elements substantially as hereinbefore described with reference to the accompanying drawing.

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**Patents Act 1977**  
**F** iner's report to the Comptroller under Section 17  
(The Search report)

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**Relevant Technical Fields**

(i) UK Cl (Ed.N) E2A (AAN, AGUC, AGUE, AGUX)  
(ii) Int Cl (Ed.6) F16B (2/24, 5/12)

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

**Search Examiner**  
P J SILVIE

**Date of completion of Search**  
9 JUNE 1995

**Documents considered relevant following a search in respect of Claims :-**  
All

**Categories of documents**

X:	Document indicating lack of novelty or of inventive step.	P:	Document published on or after the declared priority date but before the filing date of the present application.
Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	E:	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	&:	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 1197531 A	(PARKINSON COWAN) whole document	1-6
X	GB 0945198 A	(COOKE) whole document	1-6
X	GB 0874718 A	(F T PRODUCTS) whole document	1,3,4,6
X	US 4103400 A	(MICRODOT) whole document	1-6

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